Sensitive Site Development: Recent Stories

Presented by

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Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Presented for

Lake County Stormwater Management Commission

DECI Workshop

February 26, 2020

Hey and Associates, Inc. has expertise solving difficult natural resource problems, focused on:

- Stormwater engineering modelling, design, and contract specifications
- Natural and water resource permitting
- Wetland enhancement
- Landscape architecture

Multi-disciplinary Staff:

- Environmental Scientists & Ecological Restoration Specialists
- Civil Engineers
- Landscape Architects & Designers
- SESC Professionals

Sensitive Receiver Features

Floodplain (Comp Store grading)
Waters of the US (no impact)
Illinois Nature Preserves
Listed Species
Angry Neighbors

Any of those, and:

No 5 day period dry since August ’19
(Cheryl Scott, WBBM Dec 1, ’19)
Wettest Year to Date – October 31, ‘19
(Skilling’s weather blog)

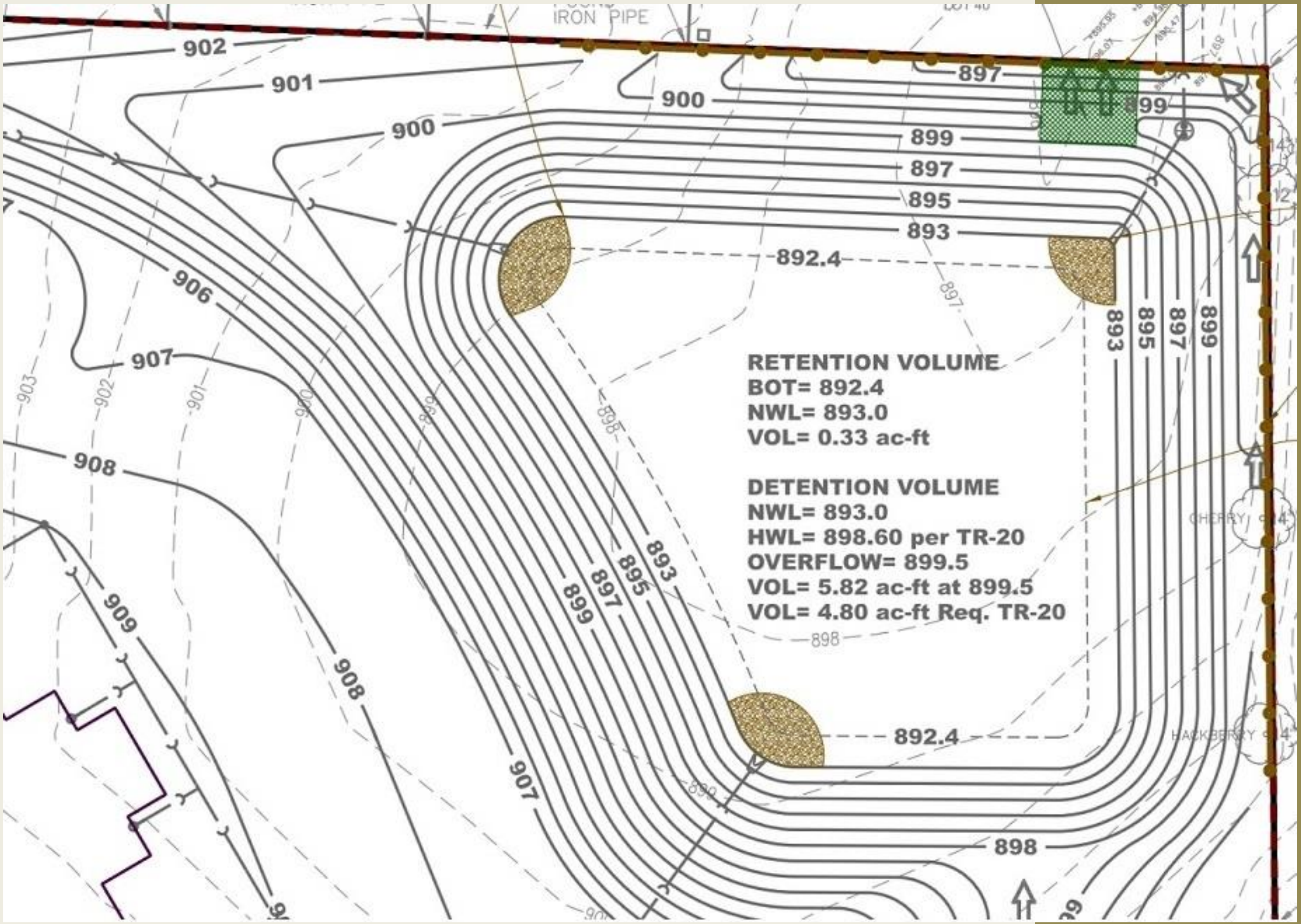
TOPICS

Design
Observation and reporting
Scheduling contractors
Updating SWPPPs
Winter maintenance and Temporary Stabilization

Design

- Construction sequencing
- Early and Continual stabilization
- Delay basin outfall installation
- Excavations for d-factor and basement
- Perf riser on sump pipe to rear yard inlets

Design



IRON PIPE
902
901
900
897
899
895
893
892.4
906
907
908
909
RETENTION VOLUME
BOT= 892.4
NWL= 893.0
VOL= 0.33 ac-ft
DETENTION VOLUME
NWL= 893.0
HWL= 898.60 per TR-20
OVERFLOW= 899.5
VOL= 5.82 ac-ft at 899.5
VOL= 4.80 ac-ft Req. TR-20
898
CHERRY
HACKBERRY

Construction sequencing

LAKE COUNTY

STORMWATER MANAGEMENT COMMISSION

TYPICAL CONSTRUCTION SEQUENCING

1.) Installation of soil erosion and sediment control SE/SC measures
   a.) Selective vegetation removal for silt fence installation
   b.) Silt fence installation
   c.) Construction fencing around areas not to be disturbed
   d.) Stabilized construction entrance

2.) Tree removal where necessary (clear & grub)

3.) Construct sediment trapping devices (sediment traps, basins…)

4.) Construct detention facilities and outlet control structure with restrictor & temporary perforated riser

5.) Strip topsoil, stockpile topsoil and grade site

6.) Temporarily stabilize topsoil stockpiles (seed and silt fence around toe of slope)

7.) Install storm sewer, sanitary sewer, water and associated inlet & outlet protection

8.) Permanently stabilize detention basins with seed and erosion control blanket

9.) Temporarily stabilize all areas including lots that have reached temporary grade

10.) Install roadways

11.) Permanently stabilize all outlot areas

12.) Install structures and grade individual lots

13.) Permanently stabilize lots

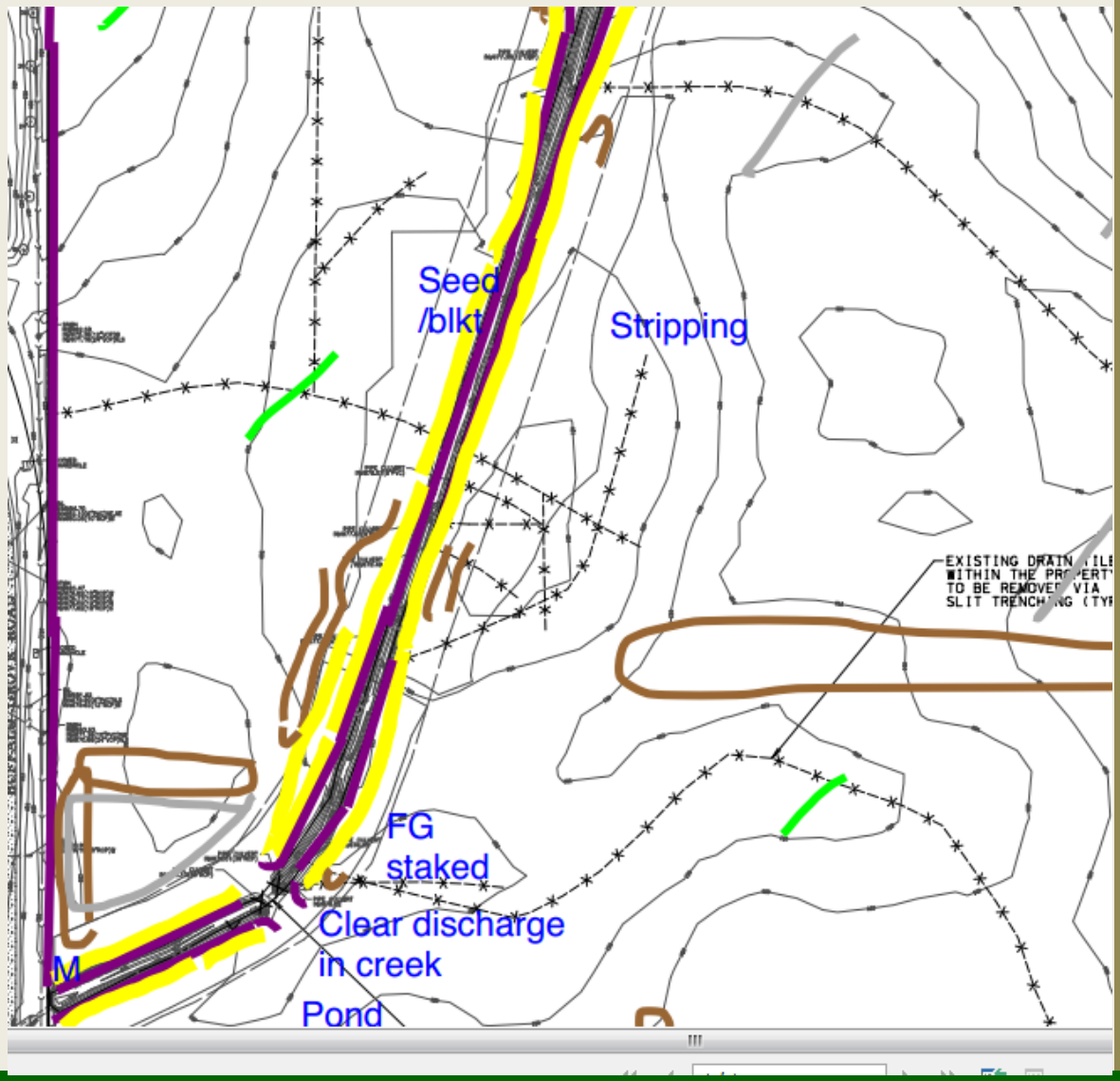
14.) Remove all temporary SE/SC measures after the site is stabilized with vegetation

* Soil erosion and sediment control maintenance must occur every two weeks and after every ½ or greater rainfall event

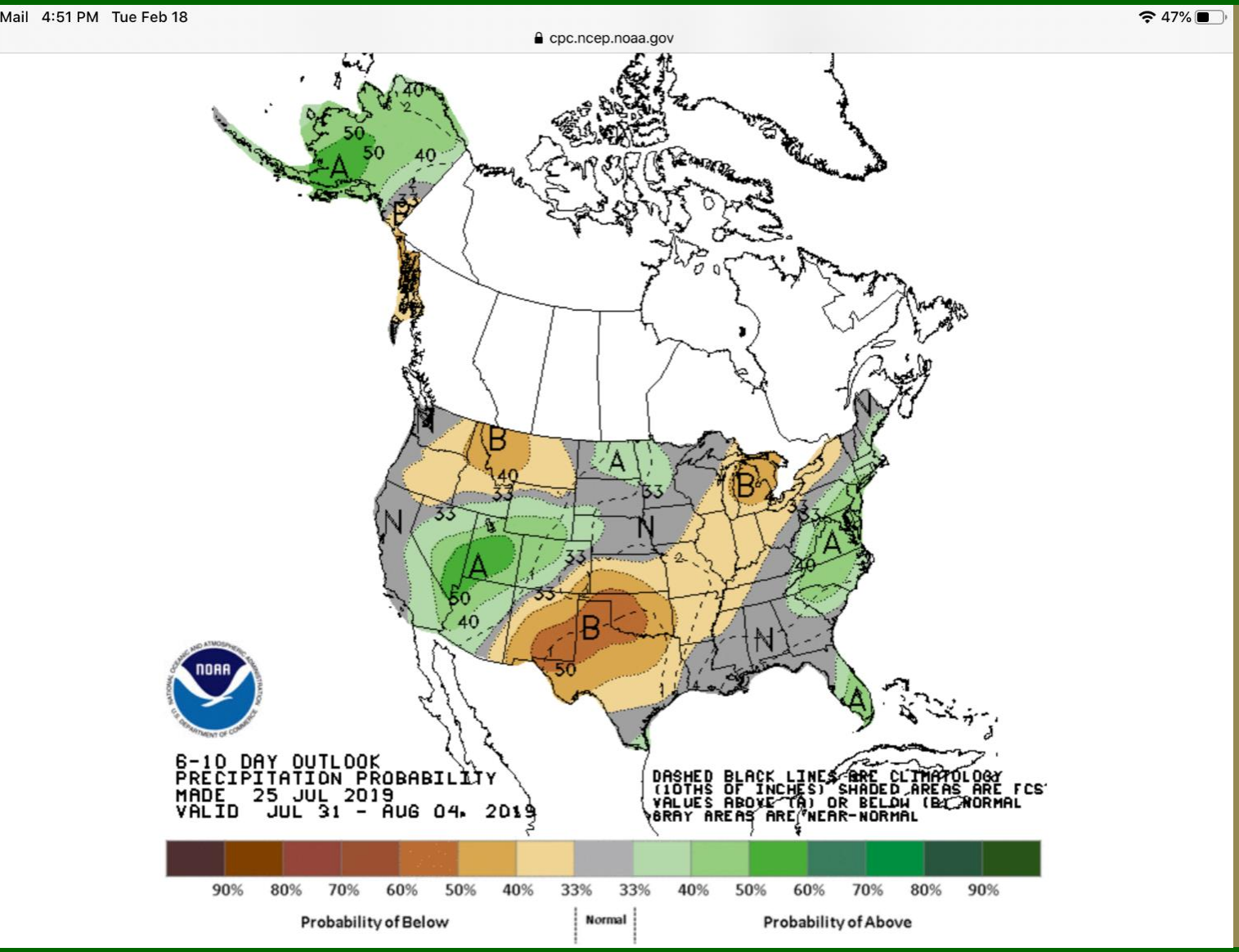
Early and Continual Stabilization

Early and Continual Stabilization

Early and Continual Stabilization



Keep a Weather Eye Out

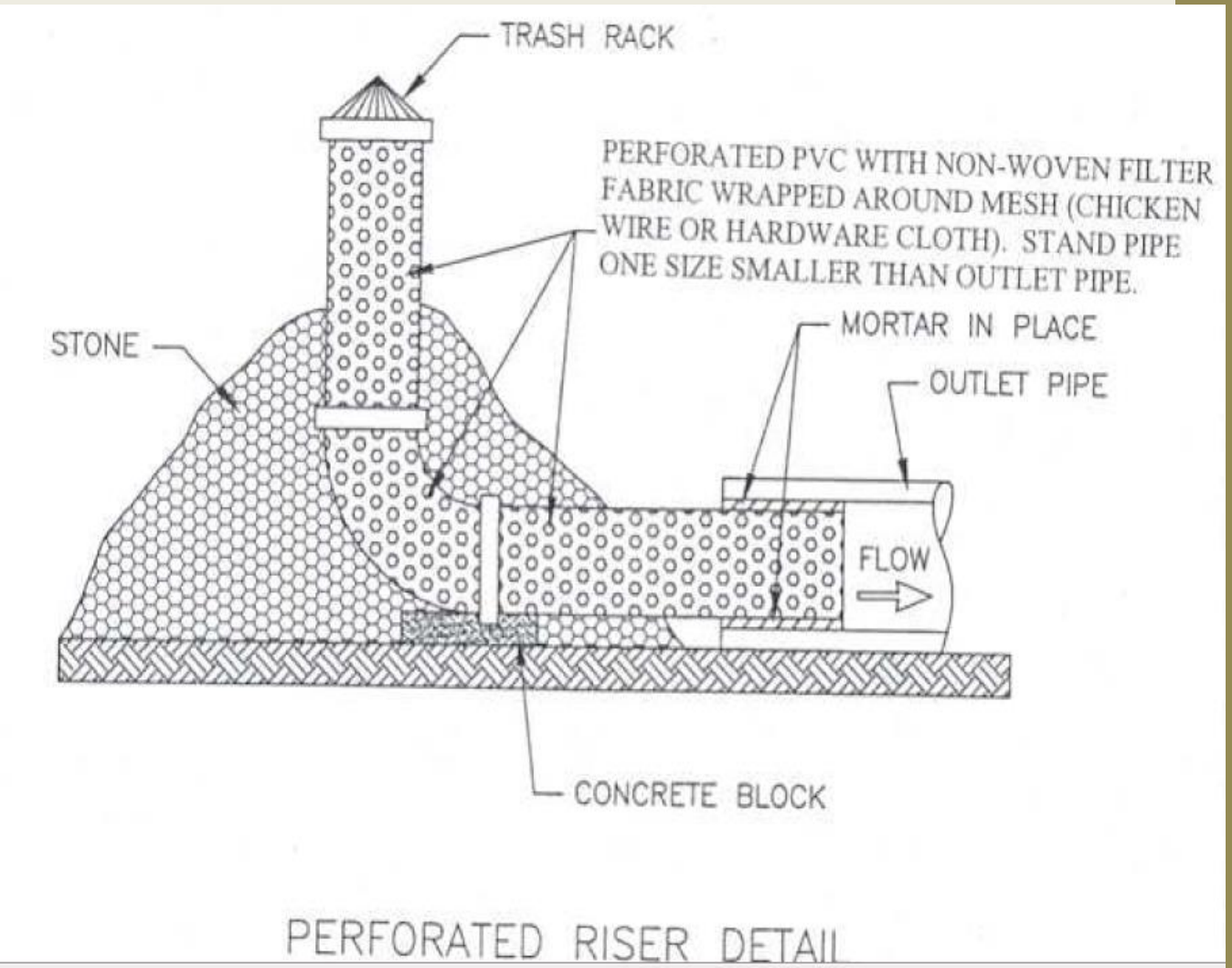


Delay Basin Outfall Installation

Rapid drawdown in loamy soils on Outwash

Excavation for basements/ d-factor

Perf risers on sump lines to rear inlets



Design

show that design works for permits;
Show dead pool volume sufficient

Implementing it time-efficiently, e.g., topsoil strip floodplain before basin excavation

observation and reporting,

- Verify water quality not affected by site by measuring clarity above & below site
- During initial stages, Check tile outlets
- Delivery timed to take advantage of good weather
- Scheduled sweeping/ scraping

observation and reporting,

What are the Seven things that need to be checked?

observation and reporting,

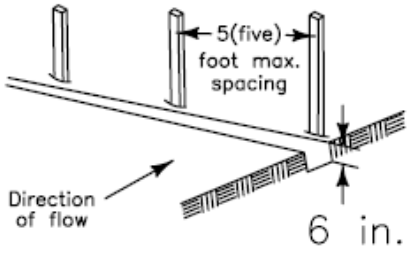
1. Disturbed areas
2. Material storage
3. On-site Flow paths
4. BMPs
5. Stabilized areas
6. Accessible discharge points
7. Site entrances/exits

Where does perimeter silt fence fail?

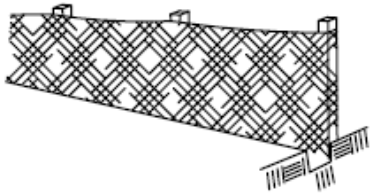
Often near the posts

Add to compaction

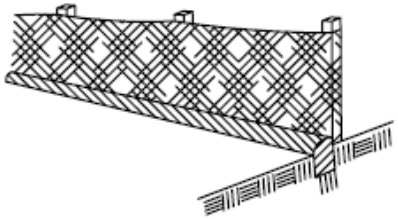
1. Set posts and excavate or slit–trench a 6–inch deep trench upslope along the line of the post



2. Attach the geotextile filter fabric to each post with a minimum of 3 (three) fasteners per post and extend to the bottom of the trench. Acceptable fasteners include staples, zip ties, or wire ties

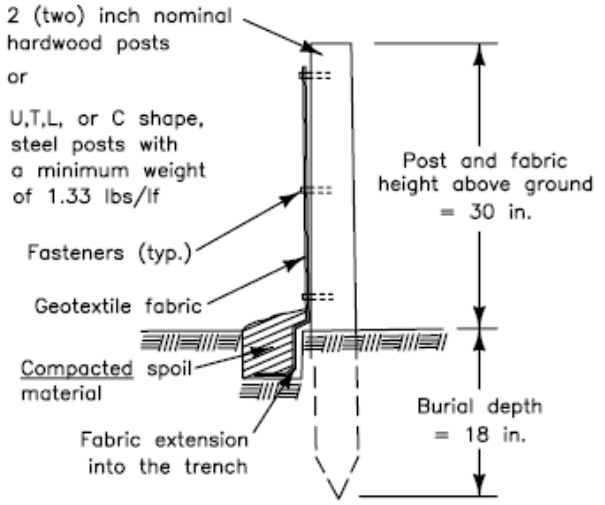


3. Backfill and compact the excavated spoil materials



Geotextile Requirement	Test Method	MARV
Grab strength	ASTM D 4632	
- Machine direction		550 N
- X-machine direction		450 N
Permittivity	ASTM D 4491	0.05 sec-1
Apparent opening size*	ASTM D 4751	0.60 mm
Ultraviolet stability (retained strength)	ASTM D 4355	70% after 500 hours

Note:
Value for apparent opening size represents maximum average roll value.



SILT FENCE DETAIL

DATE: 4/21/08 BY: KAW
REVISED: BY:

LAKE COUNTY
STORMWATER MANAGEMENT COMMISSION

Secchi clarity where water enters and exits

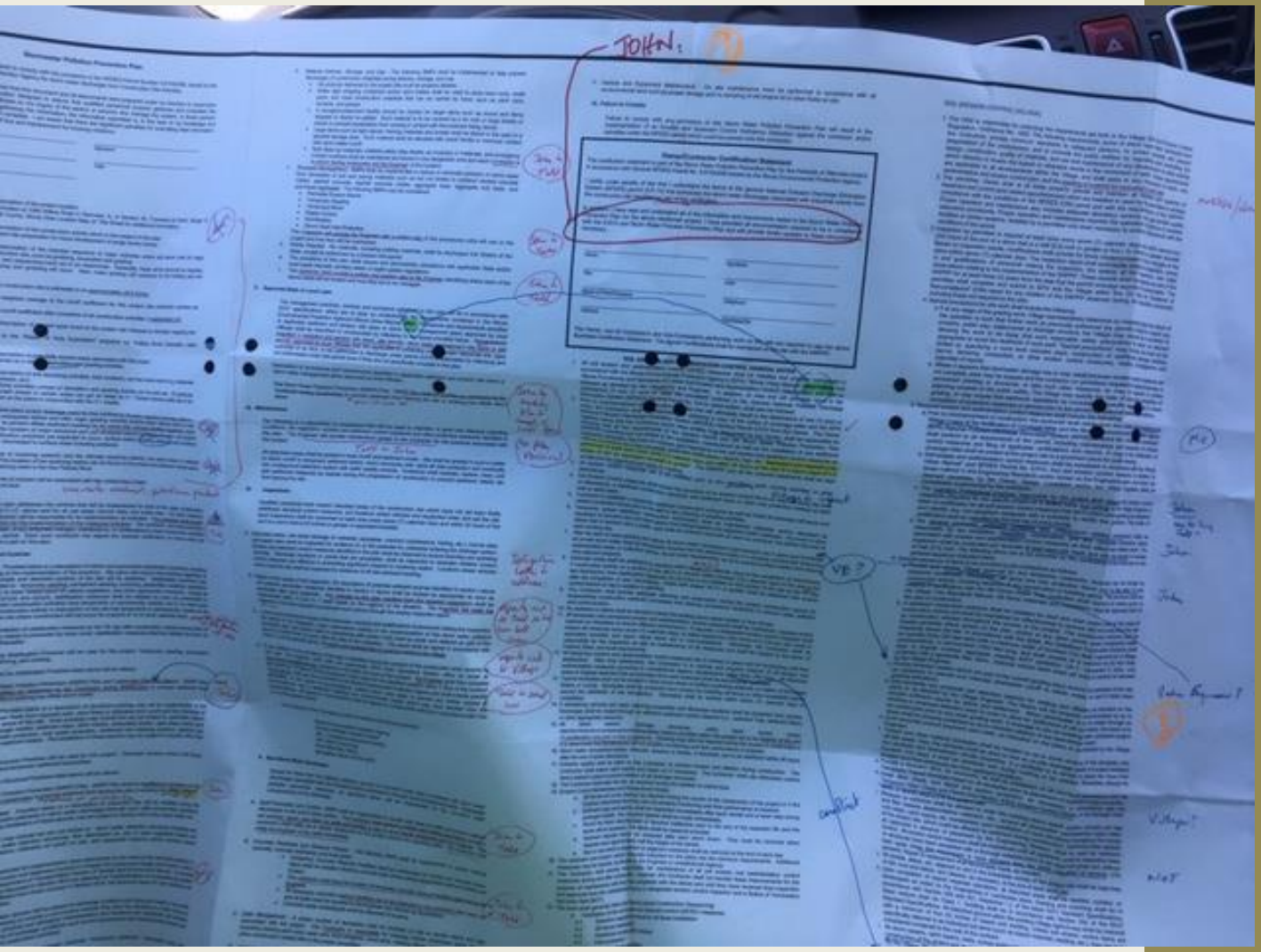
What can affect these results?

Check Existing Drain Tiles

Schedule deliveries to take advantage of good weather

Schedule Sweepers

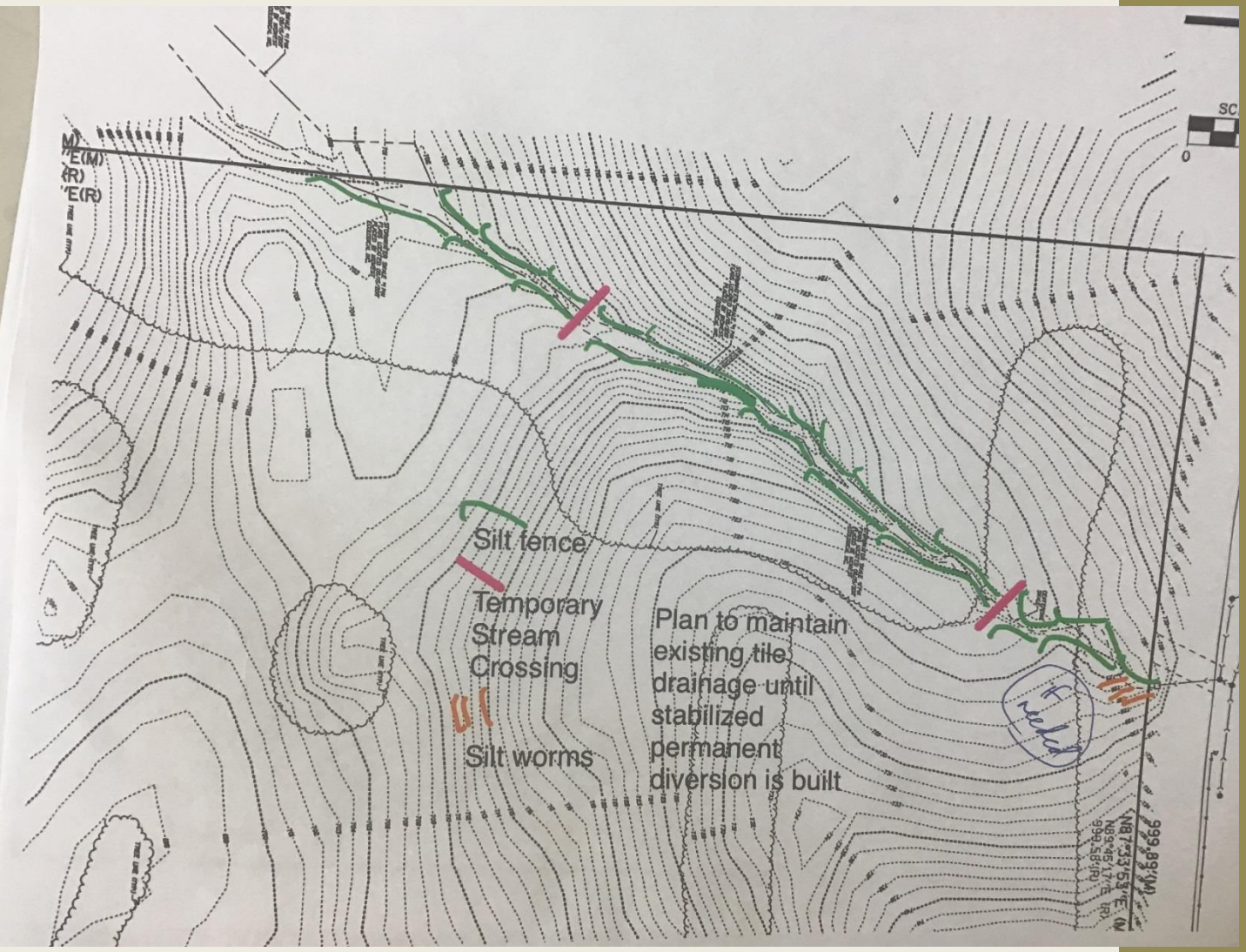
UPDATING SWPPP DURING PROJECT



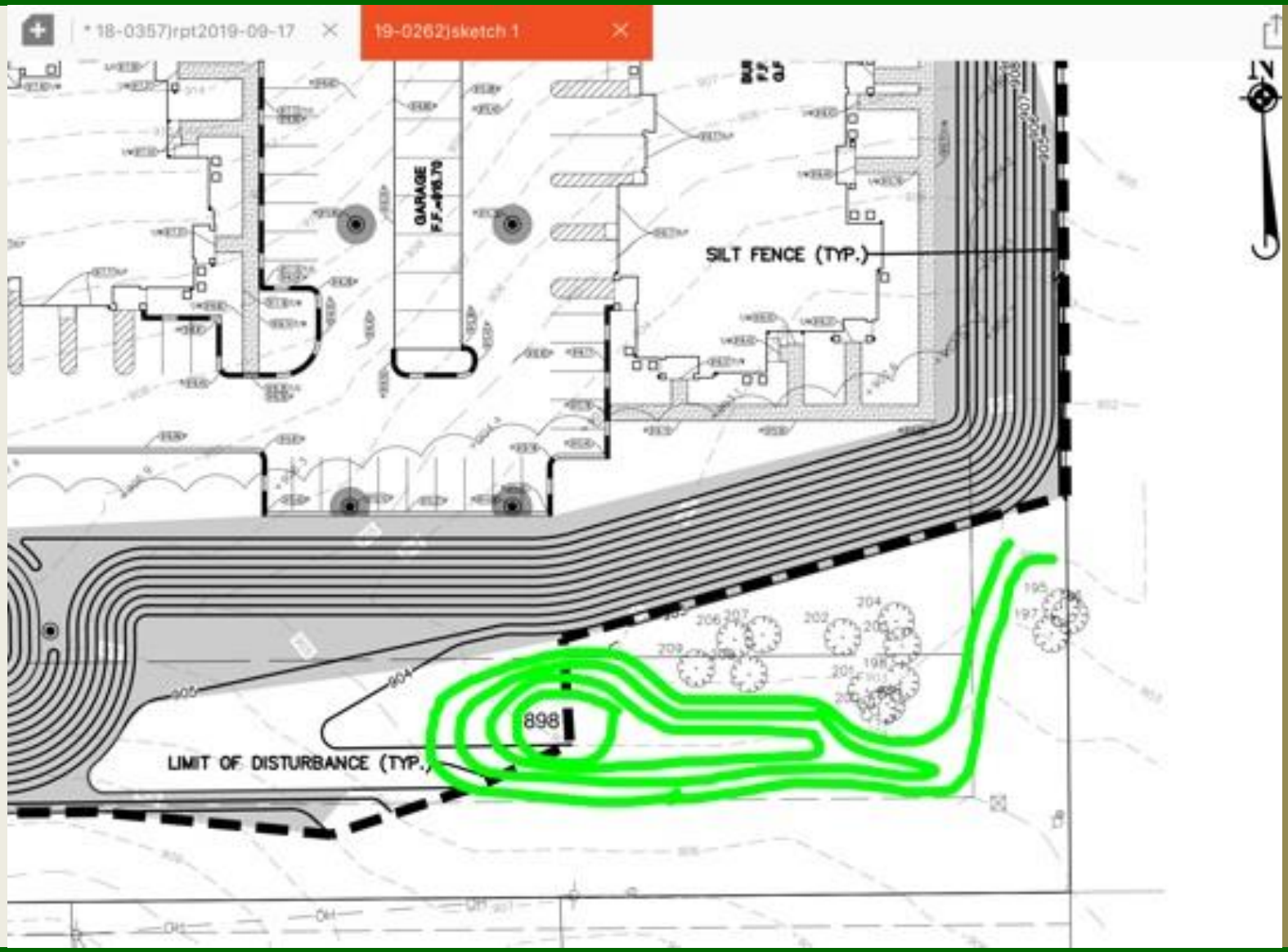
UPDATING SWPPP DURING PROJECT

"The SWPPP and site map must be modified … for any changes … no longer accurately reflected in the SWPPP."

UPDATING SWPPP DURING PROJECT

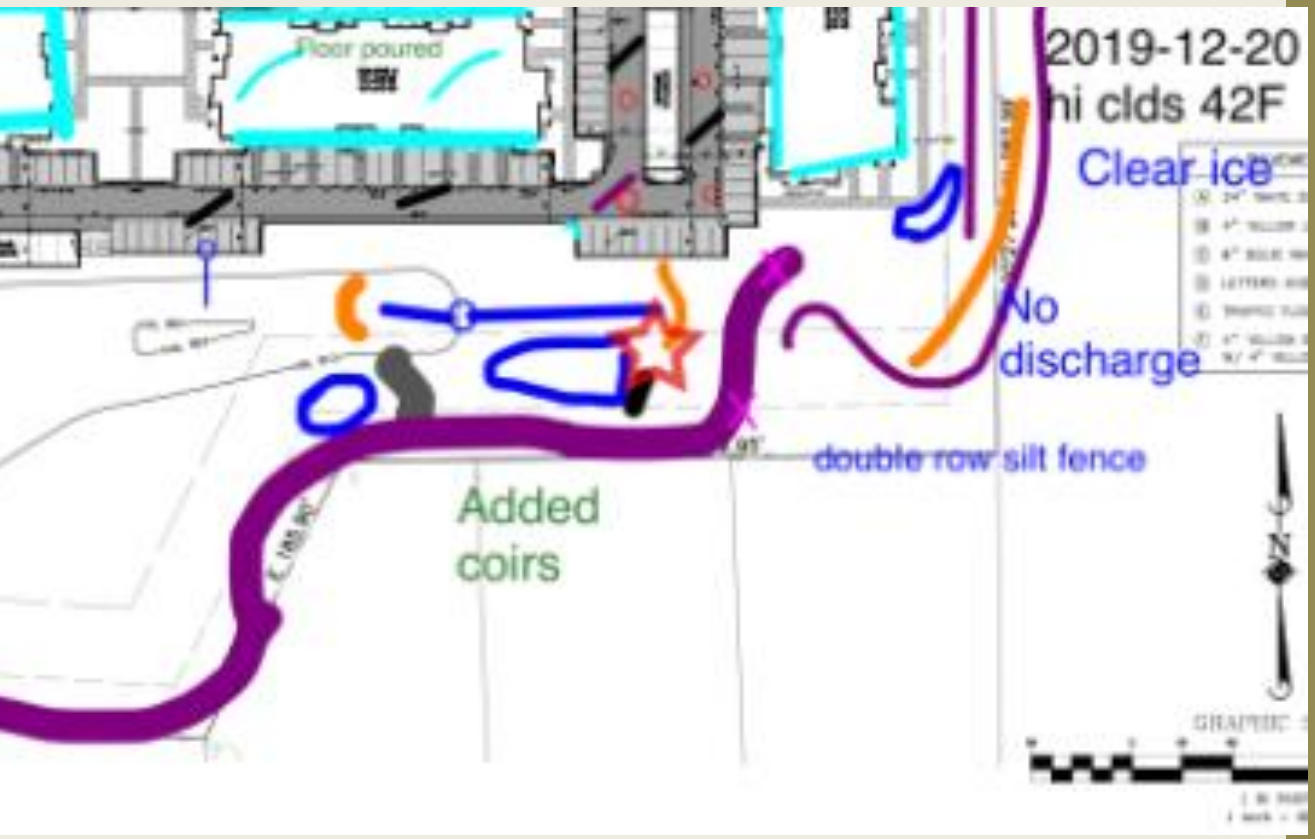


Design an update During Project



Implement a Practical Idea

Document the Update



WINTER: SEDIMENT CONTROL

RESULTS

Temporary stabilization

GRINTER ET AL. (2014)

7:40 AM Wed Feb 19 — 58% — apps.ict.illinois.edu

Table 24. Summary of Experimental Results by Region and Season*

Site	Region	USDA Zone	Treatment	Fall	Cover (%)	Spring	Cover (%)	Summer	Cover (%)	Winter	Cover (%)
Northern	North of I-80	5a 5b	Seed variety: Soil preparation: Mulch:	Tall fescue** No result No result	60	Annual ryegrass No effect No effect	92.3	Annual ryegrass or Sudex Rough Straw or mat	48.4	Annual ryegrass NA NA	5.4
Orr	North of I-72 South of I-80	5b	Seed variety: Soil preparation: Mulch:	Wheat, Barley, or Cereal rye Rough Straw or mat	2.2	Annual ryegrass Rough No effect	80.7	Annual ryegrass Rough Straw or mat	69.7	Annual ryegrass NA No effect	58.8
SIUE	North of I-64 South of I-72	6a	Seed variety: Soil preparation: Mulch:	Annual ryegrass or Wheat No effect Straw or mat	17.6	Annual ryegrass Rough Mat	42.3	Annual ryegrass or Sudex No effect Straw or mat	21.7	Annual ryegrass **** NA No effect	38
Dixon Springs	South of I-64	6b 7a	Seed variety: Soil preparation: Mulch:	Cereal rye No effect Straw or mat	28.2	Annual ryegrass No effect No effect	89.1	Sudex *** No mulch or straw	100	Annual ryegrass NA No effect	12.33

*This table shows the combination of treatments that yielded the greatest vegetative cover at each site in each season. The highest observed mean vegetative cover is listed in the cover [%] column. **Data affected by flooding. ***No data because of plot encroachment by corn. ****Based on previous observations.

Temporary Stabilization Specification Improvements. Illinois Center for Transportation

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Thank You!

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